12_04 Avoid Beginning Station 0+00

Question:

I found a bug in the new GACP [Gore Area Calculation Program], not a serious one though.
When the program kicks off the profiler app, it calculates 2 PI's at the begin of the grade. These are intended only to give the engineer the incoming tangent slope at begin station. To do that it uses a GAL function to get the station at 100' behind the begin station. The problem is this: If the ramp stationing begins at 0+00, the station 100 feet back is negative. Geopak , not capable of understanding negative stations, returns a positive station value. So, what should be -1+00 comes in as 1+00. That could be confusing to the engineer.
So far, not sure what to do about it. Except not putting the PI's in there when the begin station is 0+00.

Answer:

When possible, please avoid begin station of horizontal and vertical alignments in COGO with 0+00. There are some current and under development applications that have technical conflicts and issues with beginning station 0+00.

In addition, other Units and Agencies may run into problems with beginning station 0+00. In a May 1999 memo, entitled CADD Concerns, Location and Surveys expressed the following concern to Roadway Design.

> Along with these concerns, we would like to submit one request. The common data collection/stakeout software for Location & Surveys and Construction, TDS, requires any alignment to begin with a tangent section. This can be as small as 0.001'. If an alignment begins with station 0+00, we have no room for editing and the addition of this tangent section. Starting alignments at some value greater than 0+00 will enable the down- loading of alignments into our data collection software, which would greatly enhance both our own and Construction's electronic capabilities.

In an August 2000 memo, entitled Coordinate Reference Systems and Baseline Survey Guidelines, the following was also expressed pertaining to the beginning station of Baseline, -T- Line, ALN, and ELN surveys.

Project Control Baseline (BL & BY):

> The Project Control Baseline will be the control alignment placed on the ground for the project. This alignment will be generated in both text and graphics format. The minimum ratio of precision for baselines, including secondary baseline alignments, is 1:20,000 closure. Baselines are to begin with station 5+00.00 and should be placed such that the baseline covers the limits of the project. On North/South projects, the baseline stationing should begin with the Southernmost point with 5+00.00 and progress northward with increasing stationing. Conversely, on East/West projects, the baseline stationing should begin with the Westernmost point with 5+00.00 and progress eastward with increasing stationing. All baselines for –Y- lines should begin at the furthermost left point with station 5+00.00, if looking up station of the baseline (BL), and continue with increasing stationing to the right till the end of the project limits or intersection with –BL-. Obviously, sequential numbering of baseline points is the goal; however, due to additional requested work, required intersection points, etc. these types of acceptable exceptions may inhibit sequential numbering to be achieved in all cases.

project limits. All –T- lines should be stationed and begin at the furthermost left point of the –T- line limits with station 5+00.00, if looking up stationing of the baseline (BL), and continue with increasing stationing to the right till the end of the –T- line limits.

Types of Alignments

Proposed Project Alignments (ALN):

> The roadway design engineer will supply the proposed project alignment to the route location engineer in Geopak format as part of the original request. The proposed project alignments are to be used as a guide for establishing the project control baseline on the ground. Efforts should be made to place the baseline as near as possible to the proposed alignment, typically within 10 feet. Exceptions would be detouring around such objects as buildings, large trees, topographic features, etc.
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> This proposed design alignment will generally be computed using actual NC State Plane grid coordinates based on preliminary mapping and should begin with station 10+00.00. The roadway design engineer will also begin the final design alignment with station 10+00.00. This proposed project alignment should be localized and shown in a graphics CADD file. This will be a Microstation CADD file generated by utilizing Geopak software (See Attachment #4 for naming convention). No text file is required on the proposed alignment. Stationing will be required due to property references for appraisal data.

Best-Fit Alignments for Existing Roads (EL & EY):

> The surveyor will compute best-fit alignments for existing roads and label as -EL-, -EY-etc., as needed by designer. These are for existing road alignments that have not been staked on the ground. A text file on these alignments is not necessary, but a graphics file is. This will be a Microstation CADD file generated by utilizing Geopak software named (See Attachment #4 for naming convention). Best-fit alignments should begin with 10+00.00. Stationing may be optional, depending upon the needs of the designer. However, if appraisal data is to be referenced to this alignment, stations will be required on best-fit alignment files (See Attachment #3).

Since the chain and stationing conventions start with Location and Surveys, please use what has already been setup. It is recommended by Roadway CADD Support to start out our proposed ramps, loops, and collector distributor (-CD-) alignments in Geopak COGO with either station 5+00 or 10+00. All other proposed alignments should begin with station 10+00. This can help us avoid some of the problems we can encounter with our applications.